

Remarks

Claims 51-69, 71-89 and 91-94 remain in the application and a new claim 99 has been added with this amendment. Claims 1-50 and 95-98, standing withdrawn as being drawn to a non-elected invention and have been cancelled, but this does not indicate that Applicants have abandoned the invention or the intention to pursue patent protection for the non-elected invention.

Claims 51 and 91 have been amended to clarify that the mat has a high flame resistance, that the mat has a basis weight in the range of about 2.45 +/- 0.75 lbs./100 sq. ft., that the properties after scoring and folding are excellent and unexpected, that the glass fibers are chopped glass fibers and have a diameter in the range of about 13 to about 17.5 microns and a length in the range of about 0.5 or 0.7 to about 1.25 inch, and that the Tabor Stiffness of the mat is greater than about 50. Claim 51 has been further amended to point out that the glass fibers have a length in the range of about 0.7 to about 1.1 inch. Claim 69 has been amended to point out that the embodiment of that claim contains polyester fibers having a length of about 1/4 inch +/- 0.07 inch long and have a denier of about 1.5. Claims 71-76 have been amended to describe the glass fiber lengths in the embodiments of these claims as being in the range of about 0.7 to about 1.1 inch. Claim 92 has been amended to add the limitation of claim 77 to the mat embodiment of this claim. Claims 93 and 94 have been amended to further define the glass fiber diameters in the mat embodiments of these claims as being about 16 +/- 1.5 microns and that the air perm of the mats is in the range of about 500 to about 700 CFM/sq. ft. Basis for these amendments are as follows:

1. high flame resistance and. unexpected tensile strength after scoring & folding – page 3, first full paragraph,
2. mat basis wt. about 2.45 +/- 0.75 - page 6, 2nd full paragraph,
3. with or without a polycarboxy polymer – page 5, lines 31-34,
4. having a Taber Stiffness of at least about 50 - page 3, first full paragraph,

5. and glass fiber length in the range of about .5 (or about 0.7) to about 1.25 inch (or about 1.1 inch) – page 3, first full paragraph.
6. polyester fibers having a length of about 1/4 +/- 0.07 inch long and a denier of about
1.5 - original claim 70,
7. chopped glass fiber having diameters being about 13 to about 17.5 microns (or 16 +/- 1.5 microns) – page 3, first full paragraph, original claim 21 (13-17 microns) and
original claim 91, and
8. air perm of the mats is in the range of about 500 to about 700 CFM/sq. ft. - page 3,
latter part of first full paragraph.

The specification has been amended by adding the sentence "The glass fibers can have a diameter of about 8 to about 20 microns, including diameters in the range of about 16 +/- 1.5 microns and in the range of about 13 to about 17.5 microns" to the paragraph spanning pages 2 and 3 of the specification and by correcting the spelling of the word "centimeters" in the first full paragraph of page 3. Basis for the amendment about the diameter of the glass fibers is found in original claims 20, 21, 60 and 91. Original claim 91 provides a basis for about 16 +/-1.5 microns, i.e. about 14.5 to about 17.5 microns, and original claim 21 provides basis for glass fiber diameters of about 13 to about 17.5 microns.

The present claimed invention are mats comprised of a high content of glass fibers having diameters in the range of about 13 to about 17.5 microns and lengths in the range of about 0.7 to about 1.25 inches, and particular ratios of polymer fibers and binder of a particular type. The claimed mats have excellent flame resistance and excellent and unexpected tensile strength, flex and recovery properties after scoring and folding, the mat passing the National Fire Protection Association's (NFPA) Method #701 Flammability Test as well as critical tensile strength and Tabor Stiffness properties essential for the mat to be used in the products described above. As pointed out in the Summary section of the

specification, these properties are unique and unexpected in nonwoven mats containing a majority of glass fibers bound together with an organic binder. Such properties are very important to using non-woven mats on ceiling panels of the type mentioned above and other specialty products.

An example of a ceiling tile of the type described in U.S. Published Patent Application No. 20020020142, this ceiling tile sample having nonwoven mat dividers spanning a facer mat and a backing mat, the mat dividers being scored and functioning to fold to allow the ceiling tile to be compressed to save space for packaging and shipping. The presently claimed mats are suitable for the scored and folding dividers in this type of ceiling tile. Also presented is a Declaration by the inventor, one having more than ordinary skill in the nonwoven mat art. The Declaration provides discussion of the magnitude of difficulty of developing the presently claimed mats, why the claim limitations are critical to some or all of the properties claimed, the differences with the Geel et al and Chenoweth et al references and his conclusions about the pertinence of the references cited and the Examiner's conclusions and arguments.

Claims 51-94 were rejected under 35 USC 103 as being unpatentable over Geel in view of Arkens and as further evidenced by Chenoweth. The Examiner stated that Geel teaches nonwoven mats containing 10-80 wt. percent glass fibers and 20-90 percent PET fibers bound together with a resin binder, but not the type of binder used in the invention. The Examiner also stated that Arkens et al teaches a fiber glass nonwoven mat containing a type of binder of the type used in the invention and urges that it would have been obvious to have used the Arkens et al binder in the mats taught by Geel instead of the binder taught by Geel because both patents teach making nonwoven mats of fibers bound with a resin binder. The Examiner also admitted that neither reference teaches the ratios of wet to dry tensile strength recited in the claimed invention, but presumes, without any evidence whatever, that this property would be inherent in the mats of Geel and Arkens et al. This rejection and its basis is respectfully traversed.

First, Geel discloses a nonwoven mat for use in vinyl flooring, a completely different application having completely different requirements than application the presently claimed mat is designed for. Geel makes no suggestion that his mat has the properties needed for

use in ceiling panels of the type described in U.S. Published Patent Application No. 20020020142. Geel alleges broad ranges ratios of glass fibers to polymer fibers to binder content, but nowhere does he teach or reasonably suggest the weight percentage ranges of glass fibers, polymer fibers and binder in applicant's claimed mats. Note that Geel's examples both use a minority of glass fibers, a majority of polymer fibers and more than 40 wt. percent of binder comprised of polyvinyl alcohol and a secondary binder. Such mats are totally different in composition and properties than the presently claimed, nor does Geel reasonably suggest the mat compositions claimed. Geel teaches a mat having two binders, each applied at a different time and between two drying steps in the manufacturing process, and the Examiner did not state which binder he believes would have been obvious to have replaced with the Arkens et al binder. Nor does Arkens et al suggest using their binder in combination with polyvinyl alcohol, or the other binders Geel et al taught as substitutes for the polyvinyl alcohol binder.

Second, even if it had been obvious to use the binder of Arkens in the process of Geel, one would not have arrived at the presently claimed mats because of the different ratios of glass fibers, fiber diameters, fiber lengths, polymer fibers and binder, and more importantly one would have ended up with mats containing 15 wt. percent polyvinyl alcohol. Therefore, the mats arrived at would have had different properties than those of the present invention and would have been unsuitable for use in ceiling tile of the type disclosed here. Note, per the Jaffee Declaration that the type of binder used and the diameter and length of glass fibers used are critical to achieving a mat that has the properties recited in the claims and that it actually took more than 54 days for an expert in this art, Alan Jaffee, to discover a suitable composition for meeting the requirements of the invention.

Third, the application that the mats of the invention were designed for are for ceiling tiles of the type disclosed in US. Pat. App. No. 2002020142 as pointed out in the specification. In that patent application, the mats that were said to perform as the dividers, i.e. the mats that have to be scored and folded and then have the properties that will cause the ceiling tile to spring back into the proper thickness after having been compressed for storing and shipping and storing awaiting use, were mats disclosed in three patents owned by the assignee of the present invention, particularly US 5,840,413 and 5,942,288. The mats taught in those patents contained expensive glass microfibers, i.e. having diameters

below 5 microns, and bound with a melamine formaldehyde binder. The mats of the present invention do not require the presence of fine glass fibers to meet the requirements for the dividers in the ceiling tile and that is an unexpected result of the combinations claimed.

Fourth, the Examiner states that no weight is given to the mat properties stated in the claims, saying that "unique" is indefinite. Failing to give any weight to properties recited in an article claim is reversible error. It is improper to ignore property limitations in the claims when the composition of the item having the properties is different than reasonably taught by the reference and especially when the applicant is claiming the properties are critical to a particular different application and/or are unexpected. It is also improper to merely presume that all mats falling within very broad ranges of components, different components at that, have properties that are not remotely suggested by the reference or any reference cited. The presumptions, to be correct, must be reasonable and must be reasonably supported by evidence. Only when the compositions are exactly the same, or very nearly the same, would one be able to reasonably assume that the properties are the same, or very nearly the same. The Examiner has not met all of the structural or chemical properties of the nonwoven mats claimed, nor is there any evidence to support the allegation that any mat in the ranges taught by Geel will inherently have the properties of the claimed mats. This argument applies to the flex properties following scoring and folding, the flamibility test results, the Tabor Stiffness properties and the ratio of wet tensile to dry tensile strengths.

Fifth, the Examiner's statement that Geel teaches that the binder content of his mats is in the range of 10-30 percent is in error. Note that Geel teaches first applying 10-20 wt. percent of polyvinyl alcohol and then later, after drying this mat, applies an additional 10-30 wt. percent of a second binder. Thus, the finished mat contains from about 20 to about 50 wt. percent of binder.

Finally, Chenoweth teaches compressible blankets, col. 2, lines 45-50 and col. 3, lines 61-64, of finer glass fibers (3-10 microns in diameter) and completely different types of products than the presently claimed mats, see the Jaffee Declaration. Nor can Chenoweth reasonably suggest the compositions of the current claims, because he is dealing with different types of fibers and different types of products aimed at different applications, automotive hood liners and similar products, see col. 5, lines 25-32. Look at any automobile

hood liner and one can readily see that the products are completely different. Chenoweth does not teach or reasonably suggest that his product would be suitable for a ceiling tile of the type described earlier, nor would one skilled in the art so conclude.

For the above reasons applicant believes that the present claims are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 61-94 were rejected under 35 USC 103 as being unpatentable over Chenoweth et al in view of Arkens et al. The Examiner urges that Chenoweth teaches a nonwoven matrix of glass fibers and polymer fibers bound with a thermosetting binder that provides a rigid product having good strength and insulating properties. The Examiner further urges that it would have been obvious to the artisan to have substituted one of the binders taught by Arkens et al for the binder used by Chenoweth. This rejection is traversed.

First, as mentioned above, the present claims are drawn to a nonwoven mat, not a matrix, and Chenoweth et al do not teach making a mat. Instead, Chenoweth et al teach making an insulating blanket using wool type glass fibers, rotary spun fibers, see col. 1, lines 13-18, col. 2, lines 45-48, and col. 4, line 62, and the application for the 1-3 inch thick blankets are used for automobile hood liners and similar products. Chenoweth does not teach or reasonably suggest using chopped glass fibers, which are a completely different type of glass fibers than the rotary spun glass fibers taught by Chenoweth, see the Jaffee Declaration. Ceiling tiles of the type described in applicant's specification are not similar products because they contain mats and not insulating blankets, see the vertical mats, dividers, in the sample submitted identified as Exhibit 1. The following is taken from US Pub. Patent App. No. 20020020142:

"The dividers, on the other hand, while preferably being made of fiberglass, could be made of a carbon fiber mat, some papers, cardboards, woven materials, films, or combinations thereof, with the important feature being that they have some predetermined modulus of resiliency, similar to the specific materials identified above, which allows them to be folded but remain resilient. If the materials are to be creased to define fold lines as discussed above in connection with fiberglass material, it is important that the material retain the modulus of

resiliency after having been creased, which, of course, is true with fiberglass or carbon fiber materials." and "As mentioned, numerous materials might have applicability in the present invention, but in the preferred mode, the connector sheet and the dividers are made of the same material, which is a fiberglass mat made by Johns-Manville Corporation and the mat may be one designated No. 5802 or one designated No. 5803 by Johns-Manville. The 5802 is a 120 g/m² mat composed of 10% PET/65% 16-micron glass/25% MF. The 5803 is a 100 g/m² mat composed of 12% PET/68% 16-micron glass/20% MF. MF is an abbreviation for melamine formaldehyde resin, which exhibits the characteristics of a thermoset resin. PET is an abbreviation for a polyethylene terephthalate. Dividers made from either of the 5802 or 5803 material have the ability to expand with little or no addition of heat after having been creased and folded as described previously and after having been fully compressed. A more complete description of the Johns-Manville products and related products can be found in U.S. Pat. Nos. 5,840,413, 5,942,288, and 5,972,434, which are herein incorporated by reference. "

One of ordinary skill in the nonwoven fiber mat art would not look to Chenoweth et al for how to make a mat suitable for these ceiling tile and would not find any obvious direction there either.

For the above reasons applicant believes that the present claims are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 51-94 were rejected under the non-statutory double patenting doctrine because of the claims in pending patent application Serial No. 10/717,802 in view of Geel. The Examiner states that the claims of the copending application fail to include polymer fibers in the nonwoven mat, but that because of the teachings of Geel it would have been obvious to have included polymer fibers in the invention of the other pending application. This rejection is respectfully traversed. First, because the Jaffee Declaration shows that mats without the polymer fibers will not meet the requirements of the folding mats in the ceiling tile in Pub. App. 20020020142 and therefore are not merely an obvious modification – unexpected results flow from the claimed additions of polymer fibers. Second, the mats in the patent application Serial No. 10/717,802 will not meet the requirements for the vertical,

folding panels in the ceiling tile of Pub. App. 20020020142, but instead are for the exposed or backer facing mat joined to the vertical, folding panels. Finally, the present claims cannot prevent the practice of the invention in Serial No. 10/717,802 - that invention does not require the use of polymer fibers in the mat as the present claims require. Also, for the same reasons given above, it would not have been obvious to one of ordinary skill in the art to have modified the invention in 10/17,802 in such a way as to arrive at the present invention. The mats of 10/17,802 were designed for the facing and backer mats of the type of ceiling tile disclosed in Pub. App. 20020020142 and do not have the properties after scoring and folding necessary for the divider mat that the mats of the present invention satisfy. For these reasons the Examiner is respectfully requested to withdraw this rejection and to allow all of the claims.

Applicants believe that the claims are now in condition for allowance, but if the Examiner believes one or more issues still exist, to expedite disposal of this application the Examiner is respectfully invited to call Applicants' attorney at the number listed below to discuss the issue or issues and a way of removing.

Respectfully submitted,


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